

**DRAFT**

**ENGINEERING EVALUATION  
VERIZON WIRELESS (815034)  
PLANT NO. 16280  
APPLICATION NO. 10419**

**BACKGROUND**

Verizon Wireless (815034) is applying for an Authority to Construct and/or Permit to Operate for the following equipment:

**S-1     Emergency Standby Generator Set: Diesel Engine; Make: John Deere;  
Model: 5030HF270; Rated Horsepower: 96 HP**

The standby generator set will be used at 250 Courtland Drive, San Bruno, CA 94066.

**EMISSIONS SUMMARY****Annual Emissions:**

The load adjusted engine emission data per test method ISO 8178 D-2 for the 96 HP engine is provided by the engine manufacturer, and the emission factors are listed below. Since the engine manufacturer does not have the emission data for CO, the certification level for CO in the CARB Certification of this engine (Engine Family 4JDXL03.0064) is used. For this report, it is assumed that the emission value of Total Unburned Hydrocarbons (HC) is equivalent to the emission value of POC.

Component	Emission (g/bhp·hr)
NO <sub>x</sub>	5.065
CO	0.75
POC	0.343
PM <sub>10</sub>	0.089
SO <sub>2</sub> **	0.184

*\*\*The emission factor for SO<sub>2</sub> is from Chapter 3, Table 3.4-1 of the EPA Document AP-42, Compilation of Air Pollutant Emission Factors.*

$$SO_2 \quad 8.09E-3 \text{ (\% S in fuel oil) lb/hp-hr} = 8.09E-3 \text{ (0.05\% S) (454 g/lb)} = 0.184 \text{ g/hp-hr}$$

$$\begin{aligned}
 \text{NO}_x &= 5.065 \text{ g/bhp-hr} * 96 \text{ hp} * 100 \text{ hrs/yr} * \text{lb}/454 \text{ g} = 107.101 \text{ lbs/yr} = 0.05355 \text{ TPY} \\
 \text{CO} &= 0.75 \text{ g/bhp-hr} * 96 \text{ hp} * 100 \text{ hrs/yr} * \text{lb}/454 \text{ g} = 15.859 \text{ lbs/yr} = 0.00793 \text{ TPY} \\
 \text{POC} &= 0.343 \text{ g/bhp-hr} * 96 \text{ hp} * 100 \text{ hrs/yr} * \text{lb}/454 \text{ g} = 7.253 \text{ lbs/yr} = 0.00363 \text{ TPY} \\
 \text{PM}_{10} &= 0.089 \text{ g/bhp-hr} * 96 \text{ hp} * 100 \text{ hrs/yr} * \text{lb}/454 \text{ g} = 1.882 \text{ lbs/yr} = 0.00094 \text{ TPY} \\
 \text{SO}_2 &= 0.184 \text{ g/bhp-hr} * 96 \text{ hp} * 100 \text{ hrs/yr} * \text{lb}/454 \text{ g} = 3.891 \text{ lbs/yr} = 0.00195 \text{ TPY}
 \end{aligned}$$

### Maximum Daily Emissions:

A full 24-hour day will be assumed since no daily limits are imposed on intermittent and unexpected operations.

$$\begin{aligned}
 \text{NO}_x &= 5.065 \text{ g/bhp-hr} * 96 \text{ hp} * 24 \text{ hrs/yr} * \text{lb}/454 \text{ g} = 25.704 \text{ lbs/yr} \\
 \text{CO} &= 0.75 \text{ g/bhp-hr} * 96 \text{ hp} * 24 \text{ hrs/yr} * \text{lb}/454 \text{ g} = 3.806 \text{ lbs/yr} \\
 \text{POC} &= 0.343 \text{ g/bhp-hr} * 96 \text{ hp} * 24 \text{ hrs/yr} * \text{lb}/454 \text{ g} = 1.741 \text{ lbs/yr} \\
 \text{PM}_{10} &= 0.089 \text{ g/bhp-hr} * 96 \text{ hp} * 24 \text{ hrs/yr} * \text{lb}/454 \text{ g} = 0.452 \text{ lbs/yr} \\
 \text{SO}_2 &= 0.184 \text{ g/bhp-hr} * 96 \text{ hp} * 24 \text{ hrs/yr} * \text{lb}/454 \text{ g} = 0.934 \text{ lbs/yr}
 \end{aligned}$$

### Plant Cumulative Increase: (tons/year)

Pollutant	Existing	New	Total
NO <sub>x</sub>	0	0.0536	0.0536
CO	0	0.0079	0.0079
POC	0	0.0036	0.0036
PM <sub>10</sub>	0	0.0009	0.0009
SO <sub>2</sub>	0	0.0019	0.0019
NPOC	0	0.0000	0.0000

### Toxic Risk Screening:

The toxic emission of diesel particulate exceeds the District Risk Screening Trigger, as shown in Table (1) below, and a Risk Screening Analysis has been performed.

Table (1)

Source:	PM <sub>10</sub> Emission Factor (g/HP-hr)	HP	Annual Usage (Hours/year) <sup>1</sup>	Diesel Exhaust Particulate Emissions (lb/year):	Trigger Level (lb/yr)	Risk Screen Required? (Yes/No)
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<sup>1</sup> Annual Usage based on 100 hours per year of operation for reliability-related activities as defined in Regulation 9-8-330 ("Emergency Standby Engines, Hours of Operations").

1	0.089	96	100	1.882	0.64	Yes
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Results from the health risk screening analysis show that for 100 hours of operation per year when, excluding periods when operation is required due to emergency conditions, the maximum cancer risk is 3.72 in a million when the analysis was performed at a PM<sub>10</sub> emission 1.882 lb/year. In accordance with the District's Risk Management Policy, this risk level is considered acceptable.

The ISCST3 computer model with SCREEN3 meteorological data was used to estimate annual average ambient air concentrations. Stack and building parameters for the analysis were based on information provided by the applicant. Estimates of residential risk assume continuous 70-year exposure to annual average TAC concentrations. For off-site workers, exposure was assumed to occur 46 years out of a 70-year lifetime. For students attending Peninsula High School, exposure was assumed to occur 36 weeks per year over a 9-year period. Students were assumed to have a higher breathing rate than residents.

### **PUBLIC COMMENT**

The project is within a thousand feet of a public school and therefore subject to the public notification requirements of Reg. 2-1-412. The public notice will be posted on the internet and mailed to all Parents or Guardians with children enrolled at Peninsula High School. It will also be mailed to all residential neighbors located within 1000 feet of the proposed new source of pollution.

### **STATEMENT OF COMPLIANCE**

S-1 will be operated as emergency standby engines and therefore are not subject to the emission rate limits in Regulation 9, Rule 8 ("NO<sub>x</sub> and CO from Stationary Internal Combustion Engines"). S-1 is subject to the monitoring and record keeping requirements of Regulation 9-8-530 and the SO<sub>2</sub> limitations of 9-1-301 (ground-level concentration) and 9-1-304 (0.5% by weight in fuel). Regulation 9-8-530 requirements are incorporated into the proposed permit conditions. Compliance with Regulation 9-1 is expected since diesel fuel with a 0.05% by weight sulfur is mandated for use in California. Like all sources, S-1 is subject to Regulation 6 ("Particulate and Visible Emissions"). These engines are not expected to produce visible emissions or fallout in violation of this regulation and they will be assumed to be in compliance with Regulation 6 pending a regular inspection.

This application is considered to be ministerial under the District's proposed CEQA guidelines (Regulation 2-1-312) and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors in accordance with Permit Handbook Chapter 2.3.

**Best Available Control Technology:**

In accordance with Regulation 2, Rule 2, Section 301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO<sub>x</sub>, CO, SO<sub>2</sub> or PM<sub>10</sub>.

Based on the emission calculations above, the owner/operator of S-1 is subject to BACT for the following pollutant: NO<sub>x</sub>. BACT 1 levels do not apply for 'engines used exclusively for emergency use during involuntary loss of power' as per Reference b, Document 96.1.2 of the BAAQMD BACT Guidelines for IC Engines. Hence, the owner/operator has to meet the BACT 2 limit presented below.

POLLUTANT	BACT	TYPICAL TECHNOLOGY
	1. Technologically Feasible/ Cost Effective 2. Achieved in Practice 3. TBACT	
NOx	1. 1.5 g/bhp-hr [107 ppmvd @ 15% O2] <sup>a,b</sup> 2. 6.9 g/bhp-hr [490 ppmvd @ 15% O2] <sup>a,b,c</sup> 3. 6.9 g/bhp-hr [490 ppmvd @ 15 % O2]	1. Selective Catalytic Reduction (SCR) + Timing Retard + Turbocharger w/ Intercooler <sup>a,b</sup> 2. Timing Retard ≤ 4° + Turbocharger w/ Intercooler <sup>a,b,c</sup> 3. Timing Retard ≤ 4° + Turbocharger w/ Intercooler

For NO<sub>x</sub>, the emission limit set by BACT 2 is met, as shown in Table (2) below.

Table (2)

Pollutant	Engine Emission Factors with Catalyst (g/hp-hr)	Emission Factor Limits as set by BACT 2 (g/hp-hr)	Have the limits been met?
NO <sub>x</sub>	5.065	6.9	YES

Therefore, S-1 is determined to be in compliance with the BACT 2 limit for NO<sub>x</sub>.

Since data obtained through the ISO 8178-D2 test method was used to establish the NO<sub>x</sub> emission factor, the BACT 2 emission limit has not been incorporated into the permit conditions and is assumed to be complied with through the design standards demonstrated by the ISO 8178-D2 test method.

**Offsets:** Offsets must be provided for any new or modified source at a facility that emits more than 15 tons/yr of POC or NO<sub>x</sub>. Based on the emission calculations above, offsets are not required for this application.

PSD, NSPS, and NESHAPS do not apply.

**PERMIT CONDITIONS**

Application 10419; Verizon Wireless (815034); Plant 16280; Conditions for S-1 Emergency Diesel Generator: (PC# 19533)

1. Hours of Operation: The owner/operator will operate the emergency standby engine(s) only to mitigate emergency conditions or for the reliability-related activities. Operation for reliability-related activities shall not exceed 100 hours in any calendar year. Operation while mitigating emergency conditions is unlimited. [Basis: Reg. 9-8-330]

“Emergency Conditions” is defined as any of the following: [Basis: Reg. 9-8-231]

- a. Loss of regular natural gas supply.
- b. Failure of regular electric power supply.
- c. Flood mitigation.
- d. Sewage overflow mitigation.
- e. Fire.
- f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor.

“Reliability-related activities” is defined as any of the following: [Basis: Reg. 9-8-232]

- a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
- b. Operation of an emergency standby engine during maintenance of a primary motor.

2. The owner/operator shall equip the emergency standby engine with either: [Basis: Reg. 9-8-530]
  - a. a non-resettable totalizing meter that measures and records the hours of operation for the engine.
  - b. a non-resettable fuel usage meter, , the maximum hourly fuel rate shall be used to convert fuel usage to hours of operation.
3. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 2 years and shall be made available for District inspection upon request: [Basis: Reg. 9-8-530, 1-441]
  - a. Hours of operation (total).
  - b. Hours of operation (emergency).
  - c. For each emergency, the nature of the emergency condition.

## **RECOMMENDATION**

Issue an Authority to Construct to Verizon Wireless (815034) for the following source:

**S-1     Emergency Standby Generator Set: Diesel Engine; Make: John Deere;  
Model: 5030HF270; Rated Horsepower: 96 HP**

**EXEMPTIONS**

None.

By: \_\_\_\_\_ Date: \_\_\_\_\_

Xuna Cai  
Air Quality Engineering Intern